

The Medway Power Station on the Isle of Grain in Kent have announced the completion of a project that has increased efficiency and operational flexibility at the plant.

The improvements have been brought about by the installation of a new Clayton Steam Generator that provides an auxiliary supply of superheated steam to the plant which is one of the UK's most advanced combined cycle power stations.

The 688 MW Power Station operates with two GE Frame 9FA gas turbines and one GE reheat, condensing steam turbine. The waste heat in the exhaust from both gas turbines is utilised to produce steam in heat recovery steam generators (HRSG's) which is used to power the single steam turbine.



The driving force behind the project was the commitment of Medway Power Station to 'flexible operations' which involves the plant being shut down and re-started, as required, in response to electricity demand and prices. The new Clayton steam generator allows the station to be brought on-line and achieve base load significantly sooner after a



shutdown than was previously possible. The time saving is achieved because the new rapid steam supply is made available to seal the glands on the steam turbine long before steam from the HRSG's is available. This seal permits the vital vacuum conditions to be established on the steam condenser and reduces the time to synchronization of the gas and steam turbines.

The Clayton Steam Generator can produce up to 7,700 kg/hr of high pressure superheated steam. **Norman Bell** who is Plant Leader at the Medway Power Station said *"To ensure the success of this project we needed a boiler that could start up and quickly produce steam of high quality and at the right terminal conditions from cold, basically at the flick of a switch.*

We also investigated taking the traditional approach of using duty and standby firetube boilers and keeping one of them warm all the

time so that it would be ready for operation when we needed steam.

However, because of the flexibility we required as well as the space & budget restraints combined with efficiency and emissions considerations, the Clayton Steam Generator proved to be ideal for our purpose."

Quick start-up is an inherent feature of the Clayton design since it operates on the principle of forced circulation of water through a single coiled tube.

One of the other main advantages of the design is that the steam generator contains only a small volume of water and is therefore safe - since it is not possible to have a steam explosion using the Clayton Steam Generator.

The special low NOx gas burner on the steam generator has a predicted NOx level of less than 60 mg/Nm³, however levels of below 20 mg/Nm³ are being achieved in practice.

